

U.S. PATENT APPLICATION NO. 10/709,615
ATTORNEY DOCKET NO. 24.0910**Remarks:**

The Applicant would like to thank the Examiner for carefully reviewing the specification and claims. The Applicant particularly appreciates that claims 3-5, 7, 29 and 30 were found to recite patentable subject matter. Please reconsider the application in view of the above amendments and the following remarks.

1. Election of Invention

The Applicant affirms the prior election of invention without traverse. The Applicant respectfully requests postponement of any requirement to cancel claims 6 and 14-25 drawn to non-elected species of invention until which time as the allowability of any supervening generic claims is finally determined.

2. Claim Objections

Certain claims sustained objection for reciting "chambercoupled" where what was intended was "chamber coupled." The Applicant has amended what is believed to be each such recitation as the Examiner has required.

3. Claims Rejections – 35 U.S.C. § 103(a)

Claims 1, 2, 8-11, 26-28 and 31-37 stand rejected as obvious over Inglis et al. (U.S. Pat. No. 3,654,768 – "Inglis") in view of DiFoggio (U.S. Pat. No. 6,672,093). The Applicant respectfully traverses the rejection for the reasons which follow.

Generally, the Applicant's invention relates to vortex-tube cooling devices associated with a well logging instrument disposed in a wellbore. The Applicant's invention includes a first pressure chamber coupled to a vortex tube. The vortex tube is coupled to a second pressure chamber. The vortex chamber is coupled to a cooling chamber. The first and second pressure chambers are configured to stimulate flow of cooling fluid into the cooling chamber. All of the foregoing are disposed in a housing configured to move through or be disposed in a wellbore.

The Applicant's invention addresses a particular limitation associated with vortex tubes used as cooling devices in well logging instruments, namely, that prior art uses of such tubes for cooling purposes required connection to the surface of fluid lines in order to operate the vortex tube. The Applicant's invention addresses such limitation by providing a first pressure chamber and a second pressure chamber configured to stimulate cool fluid flow into the cooling chamber, where all the components are disposed within the instrument housing.

With respect to claim 1, it was asserted that Inglis shows all the elements of the claim, including the first pressure chamber, the second pressure chamber, the vortex tube and the cooling chamber. All that was purportedly missing in the disclosure of Inglis was the housing. Applicant respectfully disagrees. Inglis discloses a vortex-tube cooling system for electrical enclosures. The vortex tube cooling cold fluid discharge is conducted to the interior of an electrical enclosure. The cold fluid cools the interior of the enclosure, whereupon the fluid that has absorbed heat from the electrical components in the enclosure is discharged from the enclosure. Inglis does not disclose several elements of the invention of claim 1. First, there is no first pressure chamber. Pressure chamber as that term is used in the Applicant's invention is clearly a sealed enclosure that is capable of storing fluid under pressure, whether the fluid is liquid or gas. Such fluid under pressure is carried within the housing. Inglis uses a conventional, external source of pressurized gas (air) to actuate the vortex tube when a suitable valve is opened. There is nothing in Inglis to suggest that the pressurized fluid source is disposed within any housing associated with the cooling system. Further, the exhaust gas from the vortex tube is ultimately discharged to the atmosphere. Inglis does disclose that cool air from the electrical enclosure and hot gas from the hot fluid outlet of the vortex tube are admixed to increase the efficiency of the vortex tube, but ultimately these gases are released at atmospheric pressure. Any reference to "chamber" in Inglis is with reference to such admixing volumes, and is clearly not a "pressure chamber" as that term is used in the Applicant's invention. The device identified as a "pressure chamber" (92) is actually described in Inglis at col. 8, ll. 32-43 as an annular chamber which admits compressed air (from outside the cooling system) into the vortex tube. The annular chamber is not a pressure chamber within the meaning of that term as the Applicant has used it in this invention. The second element (54) identified as a "pressure chamber" is in

fact an admixing chamber that is vented to the atmosphere. See Inglis col. 5, lines 59-70. Therefore the chamber 54 is not a pressure chamber as that term is used in the Applicant's invention. Accordingly, two affirmative elements of claim 1 are not disclosed in Inglis, namely, the first and second pressure chambers.

DiFoggio shows a well logging instrument cooled by a water vaporization system associated with a sorbent to absorb water vapor generated by the vaporization system. To the extent DiFoggio is relied upon to provide the missing elements of claim 1 not shown in Inglis, as the Applicant has explained above, Inglis lacks disclosure of more than the housing that is purportedly shown in DiFoggio. Even if the system disclosed in Inglis were somehow to be combined with the coolable housing shown in DiFoggio, a device resulting only from the combined disclosures would still require an external source of pressurized fluid, and a place for the pressurized fluid to go after it has passed through the vortex chamber.

The Applicant therefore believes that claim 1 is not obvious over Inglis in view of DiFoggio.

Claims 2-5, and 7-13 ultimately depend from claim 1 and are believed to be patentable over Inglis in view of DiFoggio for at least the same reasons advanced with respect to claim 1.

Claim 26 recites a method in which the structural elements of claim 1 are provided within a housing and are operated according to the functions attributed to them in the Applicant's specification. Claim 26 is believed to be patentable for at least the same reasons explained above with reference to claim 1 because there is no first and second pressure chamber shown in Inglis or DiFoggio.

Claims 27-37 ultimately depend from claim 26 and are believed to be patentable for at least the same reasons advanced with respect to claim 26.

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Because the Applicant has shown claim 1 to be patentable over the art of record, the Applicant respectfully requests consideration of claim 6 and claims 14-25 on the merits. Claim 6 depends from claim 5, which the Examiner has already found to recite patentable subject matter.


Claim 14 includes all the limitations of claim 1 plus at least one valve disposed between the first pressure chamber and the second pressure chamber. Claim 14 is believed to be patentable for at least the same reasons advanced with respect to claim 1.

Claims 15-25 ultimately depend from claim 14 and are believed to be patentable for at least the same reasons advanced with respect to claim 14.

The Applicant believes that this Reply is fully responsive to each and every ground of rejection or objection set forth in the Office Action of August 25, 2006 and respectfully requests early favorable action on this application.

Respectfully submitted,

Date: Nov. 27, 2006


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